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HYMENOLEPIDID CESTODES FROM GREBES (AVES, PODICIPEDIDAE) IN UKRAINE: THE GENERA *DOLLFUSILEPIS* AND *PARAFIMBRIARIA*

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Цестоды-гименолепидиды поганок (Aves, Podicipedidae) Украины: роды *Dollfusilepis* и *Parafimbriaria*. Василева Г. П., Корнюшин В. В., Генов Т. — Дано переописание *Dollfusilepis hoploporus* (Dollfus, 1951) по екземплярам от *Podiceps cristatus* из Украины (регистрируется впервые). Этот же вид впервые зарегистрирован в Туркменистане у того же хозяина. Описан новый вид *Dollfusilepis grisegenicus* Vasileva, Kornyushin, Genov, sp. n. от *Podiceps grisegena*, который отличается от типового вида рода, *D. hoploporus*, в основном наличием вооружения в виде шипиков на выдвигающейся поральной части бурсы цирруса. Уточнен диагноз рода *Dollfusilepis* Vasileva, Georgiev, Genov, 1998. Переописана *Parafimbriaria micracantha* Gulyaev, 1990 по материалу от *Podiceps nigricollis* из Украины.

Ключевые слова: цестоды, поганки, Hymenolepididae, *Dollfusilepis*, *Parafimbriaria*, Украина.

Hymenolepidid Cestodes from Grebes (Aves, Podicipedidae) in Ukraine: the Genera *Dollfusilepis* and *Parafimbriaria*. Vasileva G. P., Kornyushin V. V., Genov T. — A redescription of *Dollfusilepis hoploporus* (Dollfus, 1951) based on specimens from *Podiceps cristatus* in Ukraine (new geographical record) is presented. This species is also recorded from the same host species in Turkmenistan (new geographical record). *Dollfusilepis grisegenicus* Vasileva, Kornyushin, Genov, sp. n. from *Podiceps grisegena* is described. It differs from the type-species of *Dollfusilepis hoploporus* mainly by the presence of rosethorn-shaped spines on the protrusible poral part of the cirrus-sac. The generic diagnosis of *Dollfusilepis* Vasileva, Georgiev, Genov, 1998 is amended. *Parafimbriaria micracantha* Gulyaev, 1990 is redescribed on the basis of specimens from *P. nigricollis* in Ukraine (new geographical record).

Key words: Cestodes, grebes, Hymenolepididae, *Dollfusilepis*, *Parafimbriaria*, Ukraine.

Introduction

Cestodes from grebes in Ukraine were examined during the last 70 years by various authors (Gasowska, 1931; Smogorzhevskaya, 1954, 1959, 1964, 1976; Kornyushin, 1966, 1967; Sergienko, 1969, 1972; Grushchinskaya, 1978). Most of these studies provide faunistic data only and do not present complete information on morphology of the cestode species. The Parasitological Collection of the I. I. Schmalhausen Institute of Zoology of the National Academy of Sciences of Ukraine contains cestodes from grebes collected by L. A. Smogorzhevskaya, V. V. Kornyushin, I. V. Grushchinskaya during the last fifty years from various regions of the country. The aim of this article is to present the results of the examination of the genera *Dollfusilepis* Vasileva, Georgiev & Genov, 1998 and *Parafimbriaria* Voge & Read, 1954 preserved in this collection. The species composition of the genus *Confluaria* Ablasov in Spasskaya, 1966 will be a subject of another publication.

Material and methods

Cestodes from the Parasitological Collection of the I. I. Schmalhausen Institute of Zoology of the National Academy of Sciences of the Ukraine were examined. They had been isolated from 10 specimens of three grebe species: 5 *Podiceps cristatus* (L.), 1 *P. grisegena* (Boddaert) and 4 *P. nigricollis* (Brehm). The birds were captured in the period 1949–1995 from various regions of Ukraine, mainly along the Black Sea coast. Localities: Khreshchatik (river Dnieper), Zhovnino (Kremenchug Reservoir) — Cherkassy Region; districts Potievka and Solenoozerny, Black-Sea Biosphere Reserve (BSBR) — Kherson Region; Vilkovo (Danube

Delta) — Odessa Region.Cestodes were fixed in 70% ethanol, stained in iron acetocarmine, dehydrated in an ascending alcoholic series, cleared in eugenol and mounted in Canada balsam. Some scoleces and whole specimens were mounted in Berlese's medium. Details of hosts, localities and collection numbers are given in the text for each species.

The measurements of the cirrus-sac, the external seminal vesicle, the vagina and the seminal receptacle were taken from mature proglottides only. The following measurements of the rostellar hooks were taken: the total length of the hook (together with the epiphyseal thickening); the length of the refractive particle (without epiphyseal thickenings); the length of the blade (measured from its base to the tip); the length of the base (the distance between the tip of the handle and the tip of the guard of the whole hook).

The metrical data are given as the range, the mean in parentheses and the number of measurements taken (n). The measurements are given in micrometers unless otherwise stated.

Results

Dollfusilepis Vasileva, Georgiev & Genov, 1998

Diagnosis (after Vasileva et al., 1998, with modifications): Strobila protandrous, slender. Scolex round, with conically protruded anterior part. Rostellar apparatus musculo-glandular. Rostellum armed with single crown of ten hooks. Each rostellar hook consisting of aploparaksoid refractive particle and epiphyseal thickening of handle. Suckers round, unarmed. Proglottides craspedote, wider than long. Inner longitudinal muscle bundles numerous. Genital pores unilateral. Genital ducts dorsal to osmoregulatory canals. Testes three, arranged in triangle, usually one of them porally to female primordia. External seminal vesicle oval or elliptical. Internal seminal vesicle large, elliptical. Cirrus-sac elongate, crossing mid-line of proglottis, often extending to antiporal osmoregulatory canals. Poral end of cirrus-sac protrusible, armed with refractive spines. Cirrus narrow, unarmed. Accessory sac and stylet lacking. Female glands disposed antiporally. Ovary with three compact lobes. Vitellarium oval, compact. Seminal receptacle voluminous, elliptical. Vagina with funnel-shaped, thick-walled, muscular copulatory part, surrounded with cellular sleeve and thin, tubular conductive part. Uterus sac-like, situated anteriorly and dorsally to female glands. Specific parasites of Podicipedidae. Palaearctic.

Type-species: *D. hoploporus* (Dollfus, 1951).

Remarks. The genus *Dollfusilepis* was erected as monotypic for *Hymenolepis hoploporus* Dollfus, 1951 on the basis of the re-examination of syntypes from *P. cristatus* in Morocco and specimens from the same host species from Bulgaria and Switzerland (Vasileva et al., 1998). On the basis of the Ukrainian material from *P. grisegena*, another species, *D. grisegenicus* sp. n., is described below. Therefore, the generic diagnosis of *Dollfusilepis* is amended in order to conform it to the morphology of *D. grisegenicus.*

Dollfusilepis hoploporus (Dollfus, 1951) Vasileva, Georgiev & Genov, 1998

Specimens studied. From *P. cristatus*: Coll. No 9–4, Khreshchatik, 29.10.1952, about 15 fragments of strobila, stained whole-mounts (4 slides). Coll. No 291–2, Potievka, 29.07.1987, one mature specimen and 5 fragments of strobila, stained whole-mounts (3 slides), another specimen mounted in Berlese's medium. Coll. No 1114–1, Solenoozerny, 30.09.1993, 10 fragments of strobila, stained whole-mounts (2 slides). Coll. No 1031–1, Vilkovo, 30.07.1995, one immature specimen mounted in Berlese's medium.

Redescription (Based on specimens from Coll. No 291–2, 1114–1; fig. 1–5, 14, 15; tab. 1). Strobila slender, band-like, with maximum width at post-mature proglottides. Scolex (fig. 1) conically protruded, with maximum width at posterior margins of suckers. Suckers round, with weakly-developed musculature. Rostellum ovoid, with moderately developed musculature. Rostellar sheath with weakly-developed musculature of walls, passing beyond posterior margins of suckers. Rostellar hooks 10; each hook (fig. 2) with aploparaksoid refractive particle and epiphyseal thickening of

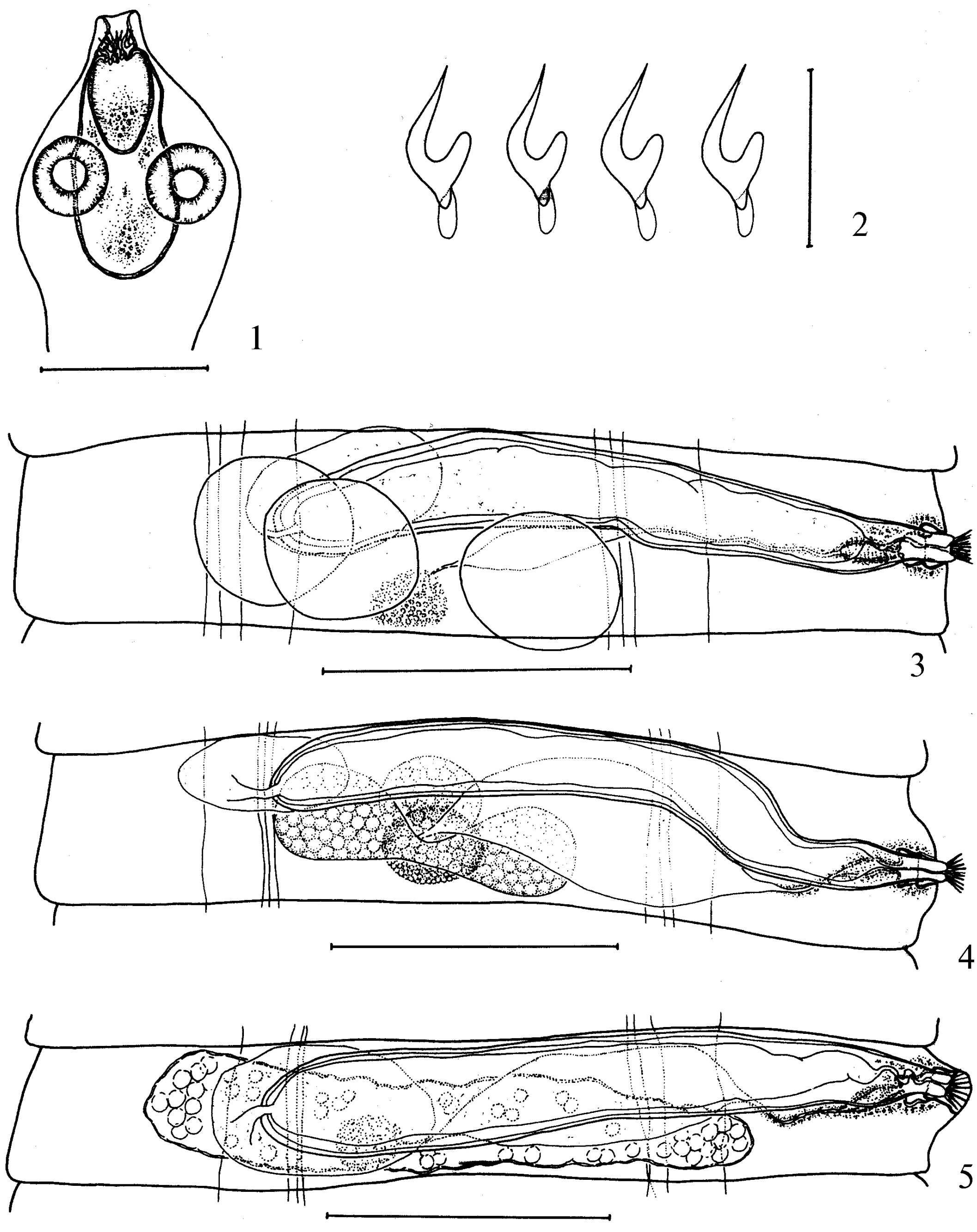


Fig. 1–5. *Dollfusilepis hoploporus*, specimens from *P. cristatus*: 1 — scolex; 2 — rostellar hooks; 3 — male mature proglottis; 4 — hermaphroditic mature proglottis; *5* — pregravid proglottis. Scale-bars: 1, 3–5 — 100 μm; 2 — 20 μm.

Рис. 1–5. *Dollfusilepis hoploporus*, экземпляры от *P. cristatus*: 1 — сколекс; 2 — хоботковые крючья; 3 — мужской членик; 4 — гермафродитный членик; 5 — не вполне зрелый членик. Масштаб: 1, 3–5 — 100 мкм; 2 — 20 мкм.

handle. Measurements of rostellar hooks: length of refractive particle 16–18 (17, n=8), length of blade 11–13 (12, n=8), length of base 12–13 (12, n=8). Proglottides (fig. 3–5) craspedote, always wider than long. Inner longitudinal muscle bundles numerous. Genital pores unilateral, situated at about middle of lateral proglottis margin. Genital

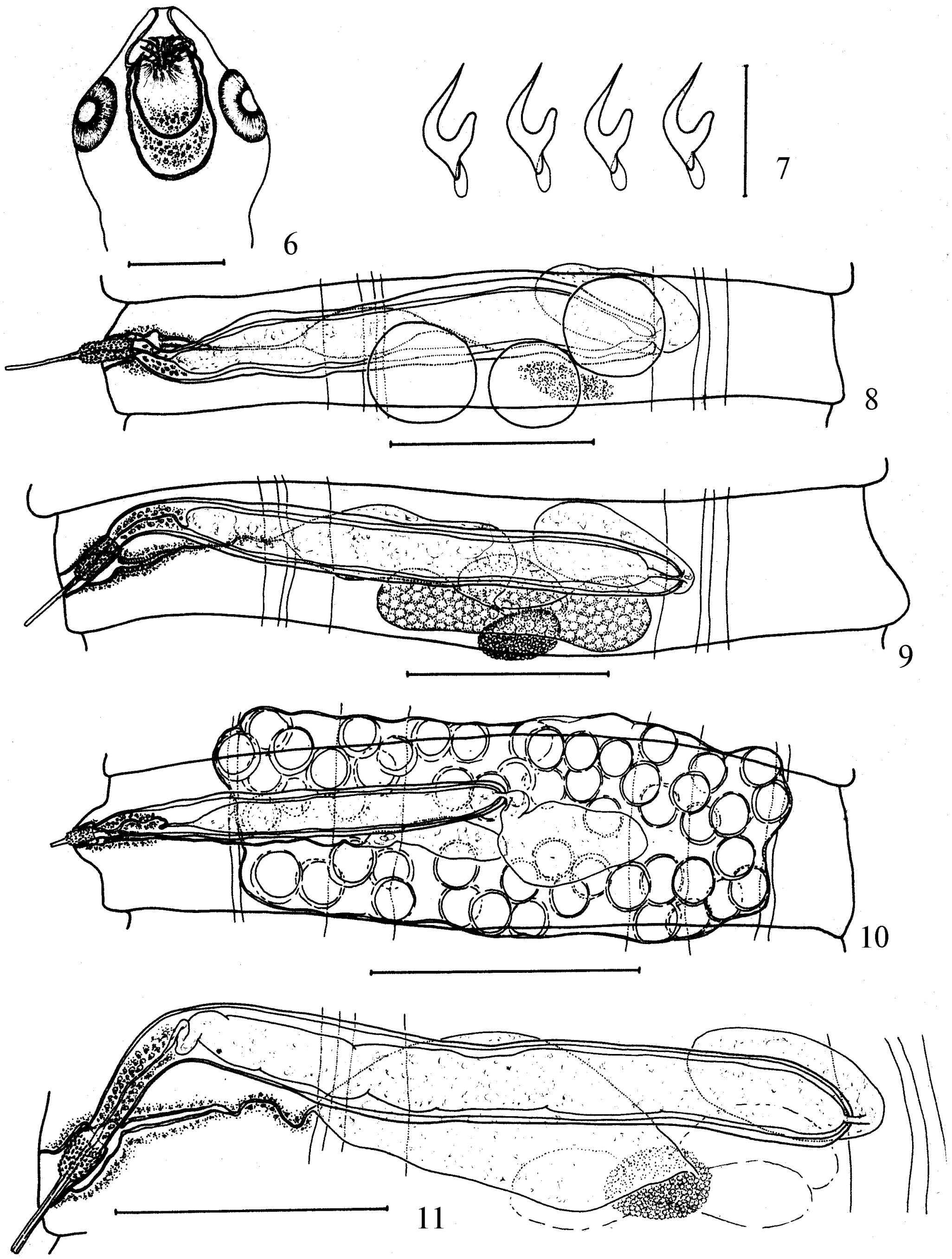


Fig. 6—11. *Dollfusilepis grisegenicus*, specimens from *P. grisegena*: 6 — scolex; 7 — rostellar hooks; 8 — male mature proglottis; 9 — hermaphroditic mature proglottis; 10 — gravid proglottis; 11 — terminal genital ducts in hermaphroditic mature proglottis. Scale-bars: 6, 8, 9, 11 — 50 μm; 7 — 20 μm; 10 — 100 μm.

Рис. 6—11. *Dollfusilepis grisegenicus*, экземпляры от *P. grisegena*: 6 — сколекс; 7 — хоботковые крючья; 8 — мужской членик; 9 — гермафродитный членик; 10 — зрелый членик; 11 — конечные половые протоки в гермафродитном членике. Масштаб: 6, 8, 9, 11 — 50 мкм; 7 — 20 мкм; 10 — 100 мкм.

atrium (fig. 4, 5) divided into male and female canals; when cirrus evaginated, atrium forming short genital papilla. Ventral and dorsal osmoregulatory canals without transverse anastomoses; diameter of ventral osmoregulatory canals 10—15 (13, n=10); di-

ameter of dorsal osmoregulatory canals 3–5 (4, n=10). Genital ducts dorsal to osmoregulatory canals.

Strobila protandrous. Testes (fig. 3) three, compact, oval, situated in shallow triangle; poral testis usually situated porally to female genital primordia. External seminal vesicle (fig. 3–5) elliptical or oval, situated dorsally to female glands, near to antiporal osmoregulatory canals. Cirrus-sac (fig. 3–5) thin-walled, highly elongate, crossing mid-line of proglottis and often extending to antiporal osmoregulatory canals. Internal seminal vesicle (fig. 3–5) very long, fills up almost entire cirrus-sac. Poral end of cirrus-sac (fig. 14, 15) protrusible, cylindrical; provided with crown of baton-like refractive spines. Evaginated cirrus (fig. 15) thin, cylindrical, unarmed.

Female genital organs disposed antiporally. Vitellarium (fig. 4) compact, elliptical or oval, situated postero-ventrally to ovary. Ovary (fig. 4) consisting of three compact lobes. Seminal receptacle (fig. 3–5) voluminous, sac-like, transversely elongate, situated ventrally to cirrus-sac and dorsally to ovary. Vagina (fig. 14, 15) opens at base of female atrial canal. Position of female atrial canal and vaginal orifice to male pore not constant, usually posterior (fig. 5, 14), often anterior (fig. 15) or lateral (fig. 3, 4). Copulatory part of vagina (fig. 14, 15) fusiform, thick-walled, muscular, surrounded by cellular sleeve. Conductive part tubular, slender, surrounded by intensively stained cells.

Developing uterus (fig. 5) sac-like, transversely elongate, situated dorsally to female glands; crossing osmoregulatory canals dorsally to them. Proglottides with fully-developed uterus and ripe eggs not available.

Remarks. The present results on *D. hoploporus* completely correspond to the previous descriptions (Dollfus, 1951; Vasileva et al., 1998), including the metrical data (tabl. 1). *D. hoploporus* is a specific parasite of *P. cristatus*. It has been recorded in various regions of the Palaearctic: Morocco (Dollfus, 1951), Switzerland, Bulgaria (Vasileva et al., 1998) and Ukraine (present study). In the Parasitological Collection of the I. I. Schmalhausen Institute of Zoology of the National Academy of Sciences of the Ukraine, specimens collected by A. Eminov from *P. cristatus* in Turkmenistan are preserved (Coll. No 365–69). Their study revealed the affiliation of this material to *D. hoploporus* (new geographical record).

Dollfusilepis grisegenicus Vasileva, Kornyushin, Genov, **sp. n.**

Specimens studied from *P. grisegena*: Syntypes: BMNH 2000.11.15.2–3, Black-Sea Biosphere Reserve, Potievka, (BSBR) 10.09.1988, one slide containing two immature specimens, stained and mounted in Canada balsam, another slide containing 5 fragments of strobila, stained whole-mounts (from Coll. No 567–7). Parasitological Collection, Institute of Zoology, Kyiv, Coll. No 567–7, with the same collecting data as above, 5 immature specimens and about 50 fragments of strobila, stained whole-mounts (14 slides), 3 scoleces mounted in Berlese's medium.

Description (fig. 6–13). Strobila very thin, band-like, with maximum width at gravid proglottides. Scolex (fig. 6) small, with conically protruded anterior part; maximum width 93–191 (130, n=4), at level just posterior to suckers; length of scolex 111–186 (137, n=4). Suckers unarmed, round, with diameter 39–64 (51, n=12). Rostellum ovoid, with weakly-developed musculature and intensively stained cells in it; measurements 54–59×36 (n=2). Rostellar sheath with weakly-developed musculature of walls, passing beyond posterior margins of suckers; intensively stained cells situated in it; measurements 90×44–49 (n=2). Rostellar hooks 10; each hook (fig. 7) with almost aploparaksoid refractive particle (with long blade, well-developed guard and short handle) and small epiphyseal thickening of handle. Measurements of hooks: total length 19–20 (19, n=14), length of refractive particle 16–18 (17, n=14), length of blade 10–

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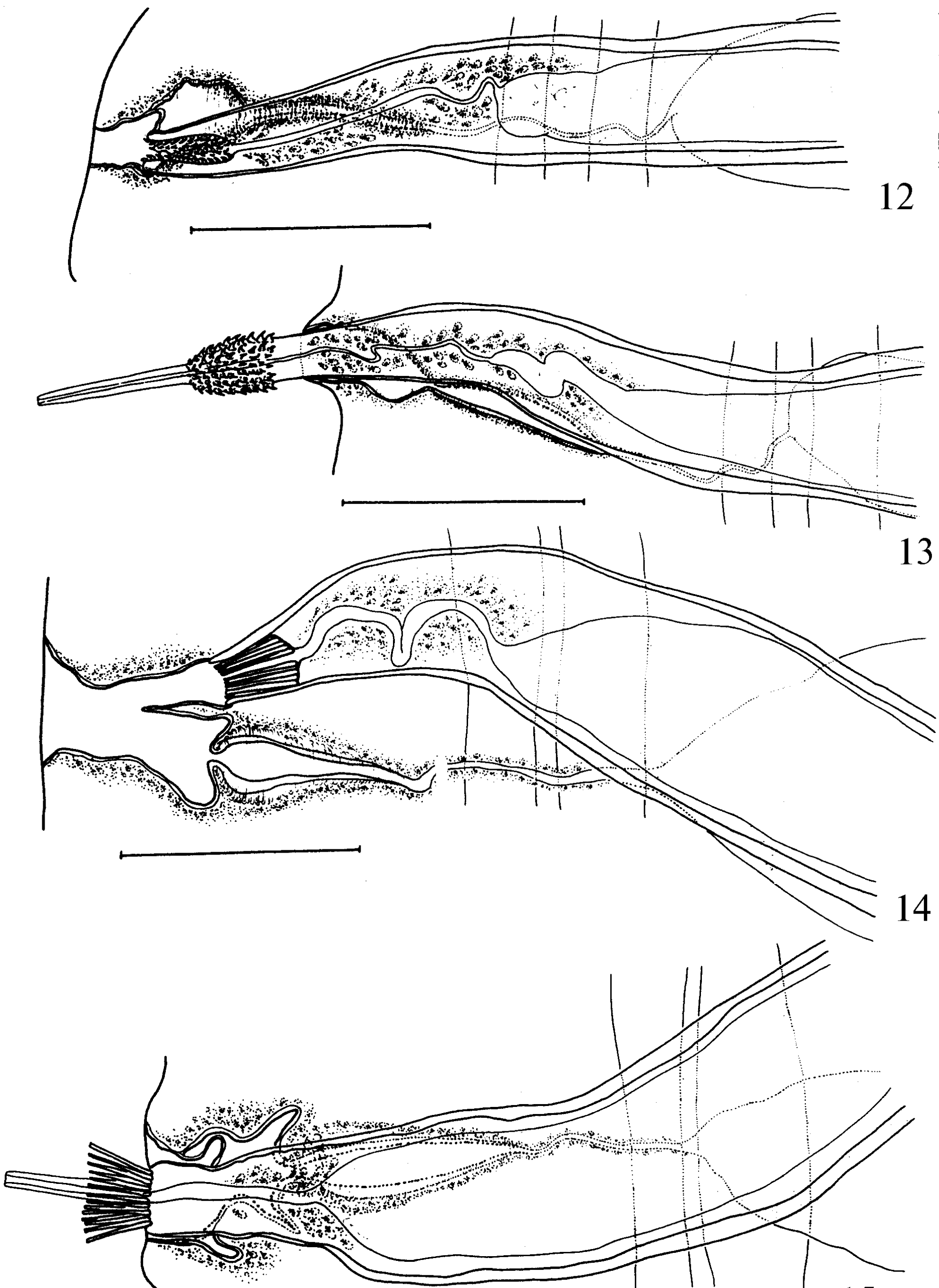


Fig. 12–15. Terminal genital ducts of *Dollfusilepis*: 12–13 — *D. grisegenicus*, specimens from *P. grisegena*; 14–15 — *D. hoploporus*, specimens from *P. cristatus*. Scale-bar 25 µm.

Рис. 12–15. Конечные половые протоки *Dollfusilepis*: 12–13 — *D. grisegenicus*, экземпляры от *P. grisegena*; 14–15 — *D. hoploporus* экземпляры от *P. cristatus*. Масштаб 25 мкм.

Table 1. Metrical data for *Dollfusilepis hoploporus* from *Podiceps cristatus*

Таблица 1. Метрические данные *Dollfusilepis hoploporus* от *Podiceps cristatus*

Metrical data, mm	Bulgaria*			Morocco*			Switzerland*			Ukraine**		
	1	2	3	1	2	3	1	2	3	1	2	3
Strobila:												
length	–	–	–	40	–	1	26.0	–	1	26–68	–	2
width	–	–	–	0.6	–	1	0.3	–	1	0.3	–	2
Scolex:												
length	–	–	–	–	–	–	188	–	1	180	–	1
width	–	–	–	170	–	1	142	–	1	129	–	1
Suckers: diameter	–	–	–	–	–	–	44–52	49	4	41–46	43	4
Rostellum:												
length	–	–	–	–	–	–	62	–	1	54	–	1
width	–	–	–	–	–		39	–	1	36	–	1
Rostellar sheath:												
length	–	–	–	–	–	–	104	–	1	129	–	1
width	–	–	–	–	–	–	64	–	1	59	–	1
Rostellar hooks: total length	–	–	–	20–21	20	4	20–21	21	4	19–21	20	8
Testes: diameter	26–34	30	30	31–36	33	10	31–39	37	20	39–49	43	20
Cirrus-sac:												
length	180–232	203	20	160–186	173	10	216–238	229	20	219–279	247	20
width	13–23	20	20	18–23	22	10	23–31	27	20	28–34	30	20
Ext. seminal vesicle:												
length	31–64	41	20	41–67	57	10	62–129	85	15	57–82	69	10
width	21–39	26	20	31–46	36	10	44–59	53	15	26–34	30	10
Vitellarium:												
length	36–41	38	15	57–77	66	10	41–46	45	10	31–44	38	10
width	18–23	20	15	41–46	43	10	28–34	31	10	18–31	28	10
Seminal receptacle:												
length	90–121	106	15	90	–	1	129–162	147	10	103–165	136	10
width	31–41	35	15	34	–	1	39–52	43	10	41–62	50	10

* Vasileva et al. (1998); ** Present study; 1 — range; 2 — mean; 3 — quantity.

Strobila protandrous. Testes (fig. 8) three, oval, arranged in triangle; diameter of testes 21–26 (24, n=10). External seminal vesicle (fig. 8–11) large, elliptical, situated dorsally to female glands, near to antiporal osmoregulatory canals, usually overlapping poral end of cirrus-sac; measurements of external seminal vesicle 44–57×15–31 (49×20, n=8). Cirrus-sac (fig. 8, 9, 11) elongate, with comparatively thick walls, crossing mid-line of proglottis and extending to antiporal osmoregulatory canals, sometimes overlapping them; intensively stained cells surrounding ejaculatory duct; length of cirrus-sac 129–147 (137, n=13), width 13–18 (15, n=13). Internal seminal vesicle (fig. 11) elongate, occupying almost entire cirrus-sac. Poral part of cirrus-sac (fig. 12, 13) protrusible, cylindrical when everted, forming wide tubular duct when withdrawn; provided with small rosethorn-shaped spines arranged in spiral rows (fig. 11, 13); length of protrusible part 10–15 (13, n=16), width 5 (n=16). Evaginated cirrus (fig. 8, 9, 11, 13) thin, cylindrical, unarmed, with length 10–18 (15, n=16) and width 2–3 (2, n=16).

Female genital organs (fig. 9) disposed antiporally. Vitellarium (fig. 9) compact, elliptical; measurements 21–28×13–18 (25×16, n=8). Ovary (fig. 9) with three compact oval lobes. Seminal receptacle (fig. 9, 11) elliptical (in young mature proglottides) or sac-like, voluminous (in hermaphroditic proglottides); situated ventrally to male genital ducts and dorsally to ovary; measurements of filled seminal receptacle 52–64×10–21 (61×14, n=4). Vagina (fig. 11–13) opens on bottom of funnel-shaped, thick-walled female atrial canal. Position of vaginal orifice and female atrial canal to male pore not constant, usually posterior (fig. 9, 11), often anterior (fig. 8, 12) or lateral (fig. 10). Copulatory part of vagina (fig. 11–13) fusiform, with thick muscular walls, surrounded with thin cellular sleeve, passing ventrally to cirrus-sac; length of copulatory part 14–17 (16, n=4), maxi-

mum width 2–3 (3, n=4). Conductive part of vagina tubular, slender, slightly convoluted.

Uterus (fig. 10) transversely elongate, sac-like, crossing osmoregulatory canals dorsally to them; with further maturation uterus fills entire proglottis. Eggs oval, with diameter of embryophore 23–26 (24, n=5); oncosphere round, with diameter 15–18 (17, n=5); embryonic hooks 5–8 (6, n=10) long.

Remarks. The structure of the rostellar hooks of the cestodes described above resembles that of the hooks of species of two hymenolepidid genera parasitising grebes, *Confluaria* spp. and *Dollfusilepis* spp. However, all the species of *Confluaria* are characterized by 8 inner longitudinal muscle bundles (Czaplinski in: Czaplinski & Vaucher, 1994; Vasileva et al., 1998; 2000) whilst there are numerous longitudinal bundles in the specimens studied, as there are in *Dollfusilepis hoploporus* (Vasileva et al., 1998). The strobilar morphology of cestodes examined fits better to the main characters included in the generic diagnosis of *Dollfusilepis* as defined by Vasileva et al. (1998). *D. grisegenicus* has three testes arranged in a triangle, a genital atrium divided into two canals, an elongate cirrus-sac reaching the mid-line of the proglottis and often extending to the antiporal osmoregulatory canals, a narrow unarmed cylindrical cirrus, female glands disposed antiporally, a voluminous sac-like seminal receptacle, a fusiform thick-walled copulatory vagina and a sac-like uterus. In these characters, *D. grisegenicus* resembles the type-species of *Dollfusilepis*. Both species have rostellar hooks with a similar shape and almost the same length (19–20 μm) and an armed protrusible poral part of the cirrus-sac. However, this part is armed with a crown of baton-like spines in *D. hoploporus* whilst it is armed with short, rosethorn-shaped spines in *D. grisegenicus*.

The armament of the protrusible poral part of the cirrus-sac has been included in the generic diagnosis of *Dollfusilepis* (Vasileva et al., 1998). The new species differs from *D. hoploporus* mainly by the armament of this part of the cirrus-sac. We consider that these results provide grounds for recognising the pattern of the armament of the protrusible poral part of the cirrus-sac as reliable character at the species level. Therefore, on the basis of the present results, we propose an amended generic diagnosis of *Dollfusilepis* (see above).

Parafimbriaria Voge & Read, 1954

Parafimbriaria micracantha Gulyaev, 1990

Syn. *Parafimbriaria websteri* Voge & Read, 1954 of Grushchinskaya (1978)

Specimens studied from *P. nigricollis*, Zhovnino, Coll. No 49–1, 06.06.1974, 1 scolex and about 20 fragments of strobila, stained whole-mounts (8 slides), 2 scoleces mounted in Berlese's medium, mentioned by Grushchinskaya (1978) as *P. websteri* Voge & Read, 1954. Coll. No 50–2, 06.06.1974, 2 mature specimens, 2 scoleces and about 16 fragments of strobila, stained whole-mounts (7 slides). Coll. No 54–3, 08.07.1974, 7 fragments of strobila, stained whole-mounts (2 slides). Coll. No 68–5, 13.07.1974, a slide containing few fragments of strobila, stained whole-mounts.

Redescription (fig. 16–22; tabl. 2). Strobila band-like, without external segmentation. Pseudoscolex lacking. Scolex (fig. 16) oval, with conically tapering anterior part; maximal width at level of suckers. Suckers oval, with weakly-developed musculature. Rostellum conical, with weakly-developed musculature; intensively stained cells present in it. Rostellar sheath sac-like, with weakly-developed musculature of walls; intensively stained glandular masses present in its cavity. Rostellar hooks 10; each hook (fig. 17) with long blade, well-developed guard and long, straight or slightly curved handle; guard and handle with almost equal length; very small epiphyseal thickening present on handle of hook. Measurements of rostellar hooks: length of blade 10–11 (10, n=10), length of base 13–14 (14, n=10), distance between guard-tip and

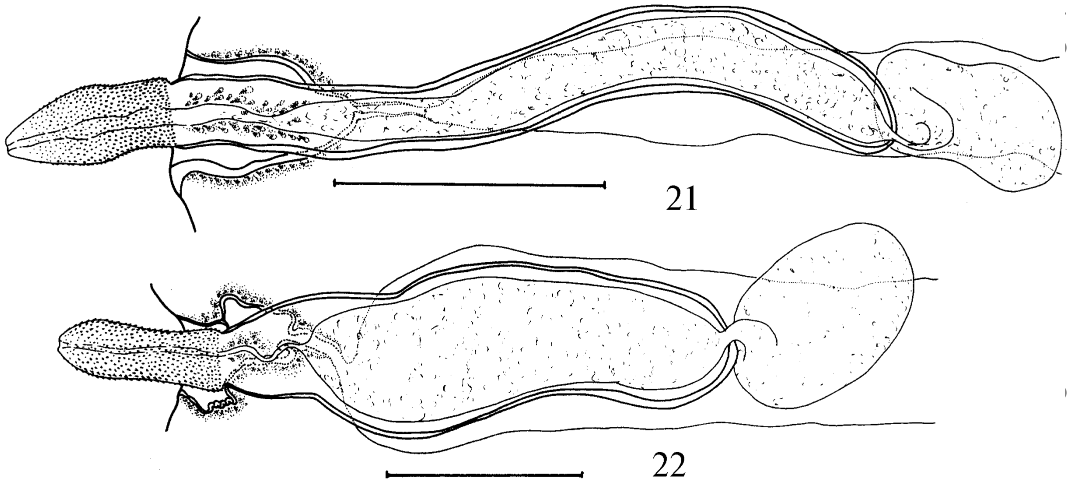


Fig. 21–22. *Parafimbriaria micracantha*, terminal genital ducts in specimens from *P. nigricollis*. Scale-bar 50 µm.

Рис. 21–22. *Parafimbriaria micracantha*, конечные половые протоки у экземпляров от *P. nigricollis*. Масштаб 50 мкм.

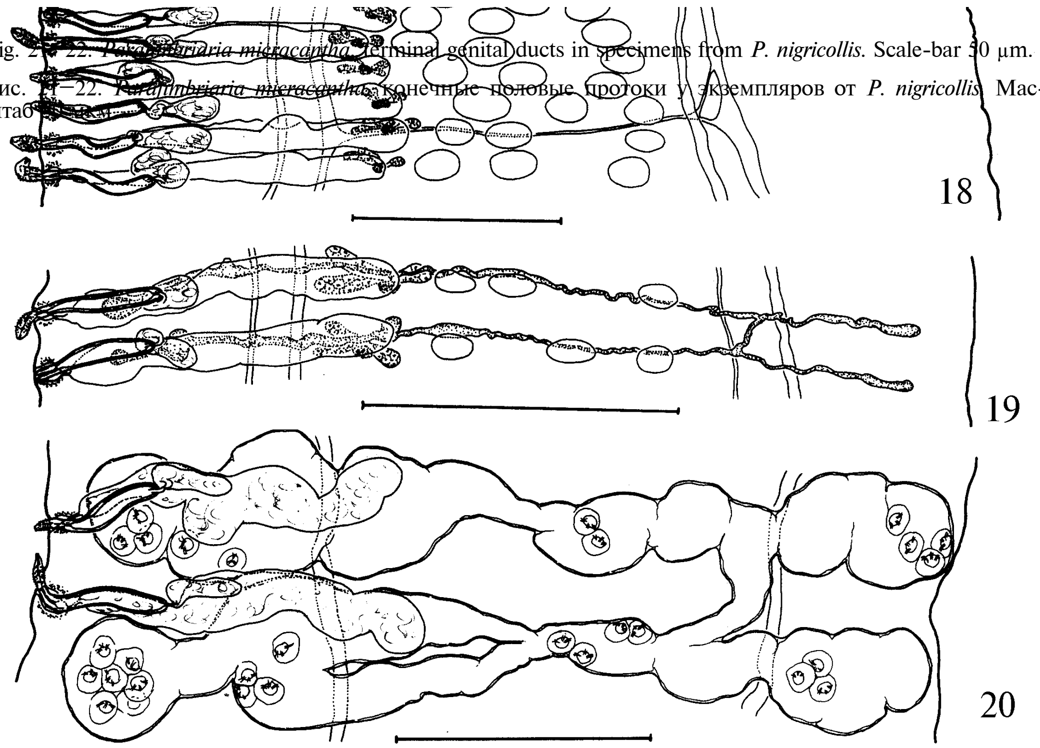


Fig. 16–20. *Parafimbriaria micracantha*, specimens from *P. nigricollis*: 16 — scolex; 17 — rostellar hooks; 18 — mature segment of strobila; 19 — segment of strobila with developing uterus; 20 — segment of strobila with gravid uterus. Scale-bars: 16 — 100 µm; 17 — 20 µm; 18, 20 — 200 µm; 19 — 300 µm.

Рис. 16–20. *Parafimbriaria micracantha*, экземпляры от *P. nigricollis*: 16 — сколекс; 17 — хоботковые крючья; 18 — половозрелый участок стробилы; 19 — участок стробилы с развивающейся маткой; 20 — участок стробилы со зрелой маткой. Масштаб: 16 — 100 мкм; 17 — 20 мкм; 18, 20 — 200 мкм; 19 — 300 мкм.

Female genital complex usually disposed porally. Vitellarium (fig. 18, 19) compact, elliptical. Ovary (fig. 18, 19) with three or four transversely elongate lobes. Seminal receptacle (fig. 18–20) sac-like, highly elongated, crossing poral osmoregulatory canals. Vagina (fig. 21, 22) with funnel-shaped, thick-walled copulatory part and short cylindrical conductive part; vagina opening and passing ventrally to cirrus-sac; vaginal orifice usually situated laterally to male pore, sometimes anteriorly (fig. 20).

Developing uterus (fig. 19) tubular, transversely elongated, with occasional intersegmental connections. With further maturation uterus fills up with eggs and becomes sac-like, thin-walled, with sacculations and rarely with fenestrations (fig. 20). Gravid uterus may have intersegmental anastomoses (fig. 20). Eggs with oval or elliptical embryophore, with length 21–29 (26, n=10) and width 18–23 (20, n=10); oncosphere elliptical or oval, with diameter 11–12 (11, n=10); embryonic hooks 8–9 (9, n=20) long.

Remarks. *Parafimbriaria micracantha* was described from *Podiceps nigricollis* and *P. grisegena* from Russia (Southern Ural, Chelyabinskaya oblast') (Gulyaev, 1990). The present results correspond closely to the detailed original description, including the metrical data (tabl. 2). The specimens of Gulyaev (1990) are characterised by larger strobila and scoleces. The Ukrainian material consists of only two whole specimens terminating with male proglottides. There are some important differences concerning the structure of the female genital system. According to Gulyaev (1990), *P. micracantha* does not possess a 'differentiated' seminal receptacle; the conductive part of the vagina is enlarged, voluminous and functions as a seminal receptacle. Our observations demonstrate that the vagina has a thick-walled funnel-shaped copulatory part and well differentiated short, thin conductive part connecting the vagina with the large seminal receptacle (fig. 21, 22). Gulyaev (1990) did not mention any anastomoses between the neighbouring uteri. We observed irregularly distributed longitudinal intersegmental uterine connections in proglottides with developing uteri as well as in those with gravid uteri.

Table 2. Metrical data for *Parafimbriaria websteri* and *Parafimbriaria micracantha*

Таблица 2. Метрические данные *Parafimbriaria websteri* и *Parafimbriaria micracantha*

Metrical data, mm	*P. websteri*		*P. micracantha*		
	California, USA* (*Podiceps nigricollis*)	Russia** (*P. nigricollis*, *P. grisegena*)	Ukraine*** (*P. nigricollis*)		
			1	2	3
Strobila:					
length	160	232–290	39–58	–	2
width	2.3	2.5–3.4	0.6–2.2	–	2
Scolex:					
length	–	–	155–175	164	3
width	120–138	210–220	152–168	159	3
Suckers: diameter	41–52	67–70	44–57	51	12
Rostellum:					
length	–	92	52–54	53	3
width	51	35	31–39	34	3
Rostellar sheath:					
length	–	158	95–103	99	3
width	–	94	54–64	58	3
Rostellar hooks: total length	36–40	20–21	20–22	21	10
Testes: diameter	–	80–130	77–90	85	20
Cirrus-sac:					
length	–	230–250	155–219	185	20
width	–	30–35	18–39	28	20
Evaginated cirrus:					
lenght	31–38	42–44	34–46	40	15
width	–	16–18	13–18	15	15
Ext. seminal vesicle:					
lenght	–	340–520	103–160	125	20
width	–	80–140	44–80	57	20
Vitellarium:					
length	–	70–100	77–98	88	10
width	–	13–55	34–49	39	10
Seminal receptacle:					
length	–	–	302–354	325	10
width	–	–	32–58	45	10

* Voge & Read, 1954; ** Gulyaev, 1990; *** Present study; 1 — range; 2 — mean; 3 — quantity.

Gulyaev (1990) differentiated *P. micracantha* from the type-species of *Parafimbriaria*, *P. websteri* Voge & Read, 1954, on the basis of significantly shorter rostellar hooks (20–21 μm in *P. micracantha* and 36–40 μm in *P. websteri*). The comparison of the morphological and metrical data given by Voge & Read (1954) and Gulyaev (1990), and the present results (tabl. 2) demonstrates that the two species are very similar and differ from one another mainly by the size of rostellar hooks. *P. websteri* differs from *P. micracantha* also by the larger rostellum and by the irregular shape and the position of the vitellarium (dorsal to ovary) (Voge, Read, 1954). The more detailed differentiation between the two species of *Parafimbriaria* needs a further re-examination of *P. websteri.*

Judging by the size of the rostellar hooks (about 20 μm long), Gulyaev (1990) considered Palaearctic records of *P. websteri* (see Ryzhikov et al., 1985) as belonging to *P. micracantha*. On the basis of the published descriptions and in agreement with Gulyaev's (1990) opinion, we regard the following Palaearctic records of *P. websteri* as belonging to *P. micracantha*: from *P. nigricollis* in the Slovak Republic (Macko, 1959); from *P. nigricollis* in the Czech Republic (Rysavy, 1961); and from *P. nigricollis* and *P. grisegena* in Poland (Sulgostowska & Korpaczewska, 1972). Since the present redescription is based partly on the material of Grushchinskaya (1978), we also regard her report of *P. websteri* from *P. nigricollis* in Ukraine as *P. micracantha*.

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